

Four new species of *Ischnodemus* (Hemiptera, Heteroptera, Blissidae) and additional records from Argentina

Pablo M. Dellapé¹, María C. Melo²

¹ División Entomología, Museo de la Plata, Universidad Nacional de La Plata, La Plata, Buenos Aires, Argentina

² Consejo Nacional de Investigaciones Científicas y Técnicas – CONICET, La Plata, Buenos Aires, Argentina

<https://zoobank.org/BEB66BA2-96C6-4356-84B1-AF7E13F62456>

Corresponding author: Pablo M. Dellapé (pdellape@fcnym.unlp.edu.ar)

Academic editor: Dávid Rédei ♦ Received 13 September 2022 ♦ Accepted 23 November 2022 ♦ Published 15 December 2022

Abstract

Four new species of the genus *Ischnodemus* Fieber, 1837 (Hemiptera, Heteroptera, Blissidae) are described from Argentina: *I. nigromaculatoides* sp. nov., *I. formosus* sp. nov., *I. infernalis* sp. nov. and *I. correntinus* sp. nov. The known distribution is extended for three previously recorded species in the country. The species *Ischnodemus brusai* Dellapé & Montemayor, 2009 from Peru is transferred to *Patritiodemus* Slater & Ahmad, 1971. Dorsal habitus photographs and detailed images of the pygophore and right paramere of the new species and a key to the Argentinean species of *Ischnodemus* are given.

Key Words

Hemiptera, key to species, Lygaeoidea, Neotropical Region, *Patritiodemus*

Introduction

Blissidae (Hemiptera, Heteroptera), commonly referred to as chinch bugs, is a diverse family of worldwide distribution, with 55 genera and 422 currently known species (Dellapé and Henry 2022). All members of the family breed only on monocotyledonous plants, with species of Poaceae being the most frequent hosts (Schuh and Weirauch 2020). They feed on the sap of plant tissues, with most of the species living between leaf sheaths (Slater 1979). The family is relatively poorly known as specimens of many taxa are not frequently collected and are easily overlooked or undercollected in the field due to their cryptic lifestyle of feeding deep inside the leaf sheaths of various Poaceae. Revisional and faunal studies of the world fauna by J.A. Slater and coauthors (Slater and Ahmad 1969; Slater et al. 1969; Slater and Wilcox 1969, 1970, 1973; Slater and Harrington 1970; Slater 1979) have greatly advanced our knowledge of the group.

The genus *Ischnodemus* Fieber, 1837, the most diverse genus in the family, includes 96 species (Dellapé and Henry 2022) and is distributed in all major biogeographic regions of the world (Slater 1979), although it

predominately occurs in the Ethiopian and Neotropical regions. Slater and Wilcox (1969) revised the Neotropical fauna, redescribed 13 species, and described 19 new species and one new subspecies. Only three Neotropical species have been described subsequently (Alayo and Grillo 1982; Dellapé and Montemayor 2009). Prior to the present study, the genus was represented by 35 Neotropical species (Dellapé and Henry 2022), 20 of which have been recorded from Argentina (Dellapé et al. 2022). Members of the genus are characterized by an elongate, parallel-sided body, closed forecoxal cavities, terete antennae, a straight apical corial margin, hemelytral membrane well differentiated in texture from the clavus and corium, and, in the Neotropical species, mutic forefemora (Slater and Wilcox 1969).

Slater and Ahmad (1969) established the genus *Patritiodemus* Slater & Ahmad, 1969, a genus purportedly closely allied to *Ischnodemus*; they transferred one species from *Ischnodemus* into it and described six new species. *Patritiodemus* can be diagnosed by the pedunculate eyes, the short labium, the completely dull pronotum, the large sperm reservoir sac, and the color pattern, whereas fore femoral spines are present in some species and absent in

others. Henry et al. (2015) provided a key to distinguish the Neotropical genera of the family, including *Patritiodemus*. In this contribution, four new *Ischnodemus* species are described from Argentina, and the known distribution is extended for three previously recorded species in the country. The species *I. brusai* Dellapé & Montemayor, 2009 from Peru is transferred to *Patritiodemus*. Dorsal habitus photographs and images of the pygophore and right paramere of the new species and a key to the Argentinean species of *Ischnodemus* are given to facilitate identification.

Materials and methods

The specimens studied belong to the following institutions: Museo de La Plata, Buenos Aires, Argentina (MLP); Museo Argentino de Ciencias Naturales ‘Bernardino Rivadavia’, Buenos Aires, Argentina (MACN); and the National Museum of Natural History, Smithsonian Institution, Washington, DC, USA (USNM). Photographs of *Ischnodemus nigromaculatus* Slater & Wilcox, 1969 were requested to the Hungarian Natural

History Museum, Budapest (HNHM). Data occurrences of material studied are given in Suppl. material 1. Color images were captured using a cellphone Sony Xperia A1 Ultra attached to an Olympus stereomicroscope SZX7 and with a Canon EOS Rebel T7i with a Professional Grade Raynox DCR 150 DSLR Objective Tube Lens and an Objective PLAN Achromatic LWD infinity 5X, mounted on a WeMacro’s automatic focus stacking rail. Multiple focal planes were taken with Helicon Remote software and merged using Helicon Focus software. Plates were created and numbered in Corel Draw 2020. The genital structures were dissected under a stereomicroscope, cleared in an 85% lactic acid solution for 5 min, washed in distilled water and preserved in vials with glycerol. Measurements were taken under a stereomicroscope and are given in millimeters. For all species, lsid links to the world catalog Lygaeoidea Species File <http://lygaeoidea.speciesfile.org/> (Dellapé and Henry 2022) are given; and for Argentinean species links to the online Pentatomomorpha species catalogue from Argentina & Uruguay <https://biodar.unlp.edu.ar/pentatomomorpha/> (Dellapé et al. 2022) are provided.

Results

Taxonomy

Key to the Argentinean species of *Ischnodemus* (modified from Slater and Wilcox 1969)

- 1 Pronotum completely shiny, lacking velvety pruinose areas on dorsal surface 2
 - Pronotum dorsally at least in part pruinose, not completely shiny, usually with shiny glabrous areas on posterior lobe 4
- 2 Pedicellus and basiflagellomere pale yellow, strongly contrasting with dark scapus and distiflagellomere; only brachypterous forms known 3
 - Antennal segments uniform in color, either black or light brown, but never with pedicellus and basiflagellomere strongly contrasting with scapus and distiflagellomere; only macropterous forms known *I. grossinigrus* Slater & Wilcox, 1969
- 3 Calli rugose and punctate, not polished and glabrous; 2nd labial segment exceeding base of head by 1/2 length of segment *I. pullus* Slater & Wilcox, 1969
 - Calli smooth and polished, never conspicuously rugose or punctate; 2nd labial segment only slightly exceeding base of head, never surpassing base of head by 1/2 its length *I. neotropicalis* Slater & Wilcox, 1969
- 4 Hemelytral membrane bearing a central black or very dark brown macula, contrasting strikingly with pale basal and apical areas 5
 - Membrane unicolorous or nearly so, most frequently pale testaceous but sometimes dark smoky grey to nearly black, at most with differentiated spots adjacent to apex of corium, or with only veins contrastingly dark; occasionally strongly micropterous and membrane lacking 13
- 5 Posterior pronotal lobe with a complete shiny band and usually nearly of equal width throughout; sometimes entire posterior half of pronotum shiny 6
 - Posterior pronotal lobe pruinose with three distinctly separated shiny areas 11
- 6 Tibiae completely dark, concolorous with dark femora *I. gayi* (Spinola, 1852)
 - Tibiae pale, contrasting with darker femora 7
- 7 Labium very short, at most slightly exceeding forecoxae *I. tibialis* Stål, 1858
 - Labium extending to or exceeding anterior margin of prosternum 8
- 8 Collar and posterior margin of pronotum pruinose 9
 - Collar shiny mesally, and pruinose area of posterior margin of pronotum restricted to humeral areas, shiny mesally 10
- 9 Basal and apical dark areas of clavus connected by a diffuse dark stripe along inner margin, central dark hemelytral macula large, contacting lateral margins of membrane (Fig. 1) *I. nigromaculatus* Slater & Wilcox
 - Basal and apical dark areas of clavus separated, central dark hemelytral macula small, not contacting lateral margins of membrane (Fig. 2B) *I. formosus* sp. nov.

- 10 Head (except clypeus) and anterior lobe of pronotum (except collar) pruinose intermixed with small shiny spots (Fig. 2A)..... *I. nigromaculatoides* sp. nov.
 – Head and anterior lobe of pronotum mostly shiny with pruinosity restricted to small irregular patches (Fig. 3A)..... *I. infernalis* sp. nov.
- 11 All femora with at least a broad median black band and frequently entirely black, with exception of basal and distal ends; pedicellus less than 1.5 times as long as interocular distance..... *I. oblongus* (Fabricius, 1803)
 – All femora pale yellow or reddish, concolorous with pale tibiae; if femora appear somewhat infusate, then pedicellus more than 1.5 times as long as interocular distance 12
- 12 Labium relatively short, not exceeding posterior margin of fore coxae and not attaining posterior margin of prosternum; antennae bright orange-yellow, distiflagellomere usually infusate..... *I. antennatus* Slater & Wilcox, 1969
 – Labium usually extending on to anterior portion of mesosternum, always exceeding posterior margin of forecoxae and attaining posterior margin of prosternum; antennae uniformly dark brown *I. formosensis* Slater & Wilcox, 1969
- 13 Pronotum completely pruinose, lacking shiny areas on posterior lobe *I. proprius* Slater, 1966
 – Pronotum possessing shiny area/s on posterior lobe 14
- 14 Posterior lobe of pronotum with a complete shiny band..... 15
 – Posterior lobe of pronotum with three distinct pruinose areas near humeri as follows: a pair of oval shiny spots on humeri and a transversely elongate median shiny area 20
- 15 Pronotal calli bearing large quadrate shiny patches *I. bosqi* Slater & Wilcox, 1969
 – Pronotal calli pruinose, at most with a series of small shiny spots interspersed with pruinosity 16
- 16 Tibiae black, concolorous with dark femora *I. severus* Slater & Wilcox, 1969
 – Tibiae pale, either strongly contrasting with dark femora, or with both tibiae and femora pale 17
- 17 Entire posterior 1/3 to 1/2 of pronotum shiny..... *I. lactipennis* Slater & Wilcox, 1969
 – Posterior lobe of pronotum with shiny area consisting of a narrow transverse band 18
- 18 Labium very short, extending posteriorly only to the forecoxae..... *I. paramoides* Slater & Wilcox, 1969
 – Labium extending posteriorly at least to anterior margin of mesosternum..... 19
- 19 Labium elongate, extending posteriorly to between mesocoxae *I. signoretii* Berg, 1883
 – Labium at most extending posteriorly on to anterior portion of mesosternum, remote from mesocoxae *I. subflavus* Slater & Wilcox, 1969
- 20 Tibiae and femora uniformly dark chocolate brown to nearly black..... *I. atricolor* Berg, 1883
 – Tibiae and femora nearly uniformly pale testaceous..... 21
- 21 Length of pedicellus greater than width of head across eyes; labium attaining or almost attaining mesocoxae; large species, more than 7.5 mm..... *I. stali* (Signoret, 1857)
 – Length of pedicellus less than width of head across eyes; labium not attaining mesocoxae, extending posteriorly only on to anterior portion of mesosternum; smaller species, less than 6.5 mm 22
- 22 Femora and tibiae yellowish, hemelytra without contrasting dark brown veins, connexiva contrasting with rest of abdomen..... 23
 – Femora and tibiae yellowish brown with anterior femora darker on basal half, hemelytra with contrasting dark brown veins, connexiva concolorous with rest of abdomen *I. spatulatus* Slater & Wilcox, 1969
- 23 Pedicellus longer than distiflagellomere, connexiva uniformly pale ochraceous *I. staliellus* Slater & Wilcox, 1969
 – Pedicellus subequal to distiflagellomere, connexiva bicolored (Fig. 3B)..... *I. correntinus* sp. nov.

Ischnodemus nigromaculatus Slater & Wilcox, 1969

Figs 1, 4D

Lsid link. <http://lsid.speciesfile.org/urn:lsid:Lygaeoidea.speciesfile.org:TaxonName:489259>.

Material examined. *Holotype* • female [photograph only]; Brasilia, Rio Grande; HNHN (Fig. 1); • 1 male 1 female; French Guiana, Mitaraka; 20-III-2015; SLAM (Sea Land and Air Malaise. Malaise Autoportant); MLP.

Diagnosis. Labium exceeding base of prosternum. Pronotum in large part pruinose, including collar and posterior margin, and with a complete shiny band on posterior lobe. Basal and apical dark areas of clavus connected by a diffuse dark stripe along inner margin (more evident in recently collected specimens); hemelytral

membrane bearing a large central dark macula, contacting lateral margins of membrane and strikingly contrasting with pale basal and apical areas (Fig. 1). Tibiae and tarsi pale, contrasting with darker femora.

Distribution. Argentina, Brazil, French Guiana and Trinidad.

Remarks. We also examined two males from La Paz, Bolivia, deposited in MLP that were provisionally included in the group “b” of the additional material studied by Slater and Wilcox (1969). These specimens are smaller, darker, with a somewhat longer labium and a narrower transverse shiny pronotal band, and we agree with Slater and Wilcox that they may represent a distinct species, but the poor condition of the specimens discourages us from describing it.



Figure 1. *Ischnodemus nigromaculatus* Slater & Wilcox, 1969. Holotype dorsal habitus and labels (HNHM).

***Ischnodemus nigromaculatoides* sp. nov.**

<https://zoobank.org/D1BB6E9E-7102-44FC-A51B-4287F222287F>

Figs 2A, 4A, 5A, 6A

Ischnodemus lactipennis: Slater and Wilcox (1969: 229) (in part).

Ischnodemus nigromaculatus: Slater and Wilcox (1969: 233) (in part).

Ischnodemus nigromaculatus (misidentification): Dellapé et al. (2015: 12).

Lsid link. <http://lsid.speciesfile.org/urn:lsid:Lygaeoidea.speciesfile.org:TaxonName:518388>.

Type material. *Holotype* ARGENTINA • male, Chaco, 3.3 km SW Makallé; 16-XII-2018; -27.1782235, -59.2362379; Dellapé, P.M. col.; MLP he-10540 (Fig. 2A).

Paratypes: ARGENTINA — **Chaco Prov.** • 1 male; Resistencia; 2-XII-[19]39; Birabén- Bezzi cols.; *Ischnodemus* var. B near *lactipennis* Slater & Wilcox, 1969; MLP he-10541 • 1 female; 12 km SE of Pampa del Indio, Prov. Rd. 3,125 m; 26°06.419'S, 59°49.599'W; 15 Dec. 2018; Henry, T.J. col.; USNM — **Córdoba Prov.** • 1 female; 5 km S Valle Hermoso; 31°11'11"S, 64°30'28"W; 7-III-2006; Carpintero-

Dellapé cols.; MLP he-10542 • 1 male; Monte Cristo; 29-XII-1944; Martínez, A. col.; *Ischnodemus nigromaculatus* Slater & Wilcox, 1967; MLP he-10543. — **Corrientes Prov.** • 1 female; Colonia Pellegrini; 4-XII-2001; Dellapé, P.M. col.; MLP he-10544 — **Formosa Prov.** • 2 females; rt. 33, 4.6 km SW Estanislao del Campo; -25.078°S, 60.139°W; 14-XII-2018; Dellapé & Melo cols.; MLP he-10545, he-10546 • 1 male; P.N. Rio Pilcomayo; 25.121°S, 58.183°W; 12-XII-2018; Dellapé & Melo cols.; MLP MLP he-10547 • 1 male; 3 km S of Pozo de Tigre, Prov. Rd. 26, elev. 200 m; 25°04.256'S, 60°06.165'W; 14-XII-2018; Henry T.J. col.; USNM — **Misiones Prov.** • 1 female; Parque Prov. Moconá, Obeia Negra; 2-IV-2012; Dellapé, P.M. col.; MLP he-10548 • 1 female; R.P. 2; 27°11.455'S, 54°00.768'W; 4-III-2010; Dellapé, P.M. col.; MLP he-10549.

BRAZIL — Pernambuco St. • 2 females; Tupanatinga, Parna do Catimbau, ICMBIO, terra 2; 8°33'54.9"S, 37°14'20.2"W; 730 m; 14-III-2019; Gonçalves, C.C., Takiya, D.M. & Carrenho, R. cols.; Malaise grande; MLP he-10550 he-10551 • 1 female; Tupanatinga, Parna do Catimbau, terreno do Icmbio, terra 2; 8°33'54.9"S, 37°14'20"W; 730 m; 14-III-2019; Gonçalves, C.C. col.; sweep; MLP he-10552.

Description (male holotype). (Fig. 2A) Total length 5.31. Head, pronotum and scutellum shallowly punctate except posterior one fourth of pronotum; sparsely clothed with short decumbent, semidecumbent, and erect setae.

Head grey-black and pruinose, except irregular areas shiny; clypeus brown apically and shiny; antenniferous tubercles shiny. Head length 0.65, head width 0.88, interocular space 0.55. Vertex flat, eyes ovoid, and set well away from anterolateral pronotal angles. Ocelli relatively large, interocellar space 0.34, closer to anterior margin of pronotum than to the eyes. Labium short attaining anterior margin of mesosternum. Labial segments length: I 0.26, II 0.36, III 0.30, IV 0.32. Antennae dark brown, apex of pedicellus and basiflagellomere paler; with abundant semierect setae; scapus slightly surpassing apex of clypeus, length of segments: scapus 0.20 pedicellus 0.48, basiflagellomere 0.46, distiflagellomere 0.66.

Pronotum (Fig. 4A) slightly sinuate laterad, narrowing gradually from mid-length of anterior lobe to collar; transverse impression shallow, nearly obsolete; posterior margin concave. Pronotum length 0.96, pronotum width 1.08. Anterior pronotal lobe grey-black, pruinose with intermixed small shiny spots, collar shiny medially; posterior pronotal lobe dark brown and shiny except humeral lobes lateral to scutellum pruinose. Metathoracic scent gland auricle slightly produced anteriorly, yellowish basally and brown dorsally. Scutellum grey-black, pruinose, with a longitudinal median fringe without punctures. All femora moderately incrassate, mutic. Coxae and femora dark brown, femora paler apically; trochanters, tibiae and tarsi light brown. All legs with abundant decumbent short setae. Hemelytra reaching anterior area of 6th abdominal tergum, length 3.16. Hemelytra creamy white, except apical area of corium orange brown, and with dark brown as follows: basal 1/4 and apex of clavus, apical half of inner margin and posterior margin extending to outer

margin of corium adjacent to the orange macula, and a large irregular median macula on membrane contacting posterior margin of corium next to orange macula. Sterna pruinose, except a rectangular shiny area on mesosternum.

Abdomen brown, darker from segment VII to apex. Male genitalia: Pygophore (Fig. 5A) dorsal aperture elongate, anterior margin subtriangular, elongate, inner projections short, posterior margin deeply concave medially. Parameres: Blade long, outer projection small (Fig. 6A).

Etymology. The specific epithet refers to the similarity of the species to *I. nigromaculatus*; the Greek suffix ‘-oides’ means ‘similar to’.

Distribution. Known from several localities in northern Argentina, Brazil and Paraguay.

Measurements of paratypes (min–max, mean). Males ($n = 3$): Total length 5.56–6.06, 5.64. Head length 0.68–0.78, 0.70, head width 0.83–0.99, 0.90, interocular space 0.52–0.60, 0.57, interocellar space 0.31–0.34, 0.33. Labial segments length: I 0.26–0.28, 0.27, II 0.32–0.36, 0.35, III 0.30–0.34, 0.31, IV 0.26–0.32, 0.30. Antennal segments length: scapus 0.18–0.22, 0.21 pedicellus 0.54–0.56, 0.53, basiflagellomere 0.48–0.50, 0.48, distiflagellomere 0.64–0.70, 0.67. Pronotum length 0.96–1.14, 1.02, pronotum width 1.04–1.33, 1.13. Hemelytra length 3.20–3.56, 3.31.

Females ($n = 5$): Total length 6.13–7.44, 6.48. Head length 0.70–0.81, 0.76, head width 0.83–1.01, 0.90, interocular space 0.52–0.62, 0.57, interocellar space 0.36–0.39, 0.37. Labial segments length: I 0.28–0.40, 0.33, II 0.32–0.44, 0.38, III 0.32–0.40, 0.36, IV 0.32–0.40, 0.36. Antennal segments length: scapus 0.18–0.24, 0.21 pedicellus 0.46–0.54, 0.50, basiflagellomere 0.44–0.52, 0.47, distiflagellomere 0.60–0.70, 0.65. Pronotum length 1.01–1.30, 1.08, pronotum width 1.12–1.46, 1.23. Hemelytra length 3.12–3.92, 3.48.

Remarks. This new species corresponds to the variety “*a*” of *I. nigromaculatus* mentioned by Slater and Wilcox (1969) that included specimens from Argentina and Brazil, but was not included in their type series because they expressed doubt about their conspecificity. From their material we studied the male from Córdoba, Monte Cristo, which is included here as a paratype of the new species. Also, the male paratype from Chaco, mentioned by Slater and Wilcox (1969) as variety “*b*” of *I. lactipennis*, together with four other specimens from Argentina, Brazil and Paraguay, have a large dark membrane marking that is absent in *I. lactipennis* s. str. We therefore treat these specimens as *I. nigromaculatoidea* sp. nov. Lastly, the female from Obelia Negra, identified as *I. nigromaculatus* in the inventory from Moconá Provincial Park (Misiones, Argentina) by Dellapé et al. (2015), pertains to this new species as well.

Ischnodemus formosus sp. nov.

<https://zoobank.org/9877BB27-5B95-4C0F-BFF5-7466F3045526>

Figs 2B, 4B, 5B, 6B

Lsid link. <http://lsid.speciesfile.org/urn:lsid:Lygaeoidea.speciesfile.org:TaxonName:518389>.

Type material. *Holotype* ARGENTINA • male; Formosa, ruta 14, 12 km NW Colonia Pastoril; 25.571°S, 58.322°W; 11-XII-2018; Dellapé & Melo cols.; MLP he-10554. *Paratypes*: ARGENTINA — **Formosa Prov.** • 6 males 8 females; same data as for holotype; MLP he-10555 to he-10560 (males) he-10561 to he-10568 (females) • 2 males 2 females; same data as for preceding; MACN • 2 males 2 females; same data as for preceding; USNM • 1 male 1 female; P.N. Rio Pilcomayo; 25.571°S, 58.322°W; 11-XII-2018; Dellapé & Melo cols.; MLP he-10569, he-10570 • 15 males, 9 females, 4 5th instars & 1 4th instar; Prov. Rd 2, rd to Clorinda off small side rd, 175 m; 25°35.243'S, 58°19.303'W; 11-XII-2018; Henry, T.J. col.; ex sedges; USNM.

Description (male holotype). (Fig. 2B) Total length 5.63. Head, pronotum and scutellum shallowly punctate except on shiny transverse band on posterior pronotal lobe; sparsely clothed with short decumbent, semidecumbent and erect setae.

Head grey-black, pruinose dorsally except shiny clypeus and antenniferous tubercles. Head length 0.70, head width 0.88, interocular space 0.55. Vertex flat, eyes ovoid, and set well away from anterolateral pronotal angles. Ocelli relatively large, interocellar space 0.34, closer to anterior margin of pronotum than to the eyes. Labium short attaining anterior margin of mesosternum. Labial segments length: I 0.30, II 0.40, III 0.36, IV 0.40. Antennae dark brown, apex of pedicellus and basiflagellomere, and distiflagellomere distally paler; with abundant decumbent and sparse semierect setae; scapus slightly surpassing apex of clypeus, antennal segments length: scapus 0.23, pedicellus 0.64, basiflagellomere 0.58, distiflagellomere 0.72.

Pronotum (Fig. 4B) slightly sinuate laterad, narrowing gradually from mid-length of anterior lobe to collar; transverse impression shallow, nearly obsolete; posterior margin concave. Pronotum length 1.07, pronotum width 1.22. Anterior pronotal lobe grey-black, pruinose with intermixed small shiny spots, collar entirely pruinose; posterior pronotal lobe with a complete transverse shiny and smooth band, posterior margin entirely pruinose. Metathoracic scent gland auricle slightly produced anteriorly, yellowish basally. Scutellum grey-black, pruinose, with a longitudinal median fringe without punctures. All femora moderately incrassate, mutic. Coxae and femora dark brown, femora paler apically; trochanters, tibiae and tarsi light brown. All legs with abundant decumbent short setae. Hemelytra surpassing half the length of 6th abdominal tergum, length 3.04. Hemelytra creamy white, except apical area of corium orange brown, and with dark brown as follows: basal one fourth and apex of clavus, a broad band along posterior margin attaining the orange brown macula extending anteriorly over Cu vein, and a well delimited and contrasting rounded dark macula on membrane. Sterna pruinose, except a rectangular shiny area on mesosternum.

Abdomen brown to dark brown, connexiva paler. Male genitalia: Pygophore (Fig. 5B) dorsal aperture relatively short, anterior margin slightly rounded, inner projections

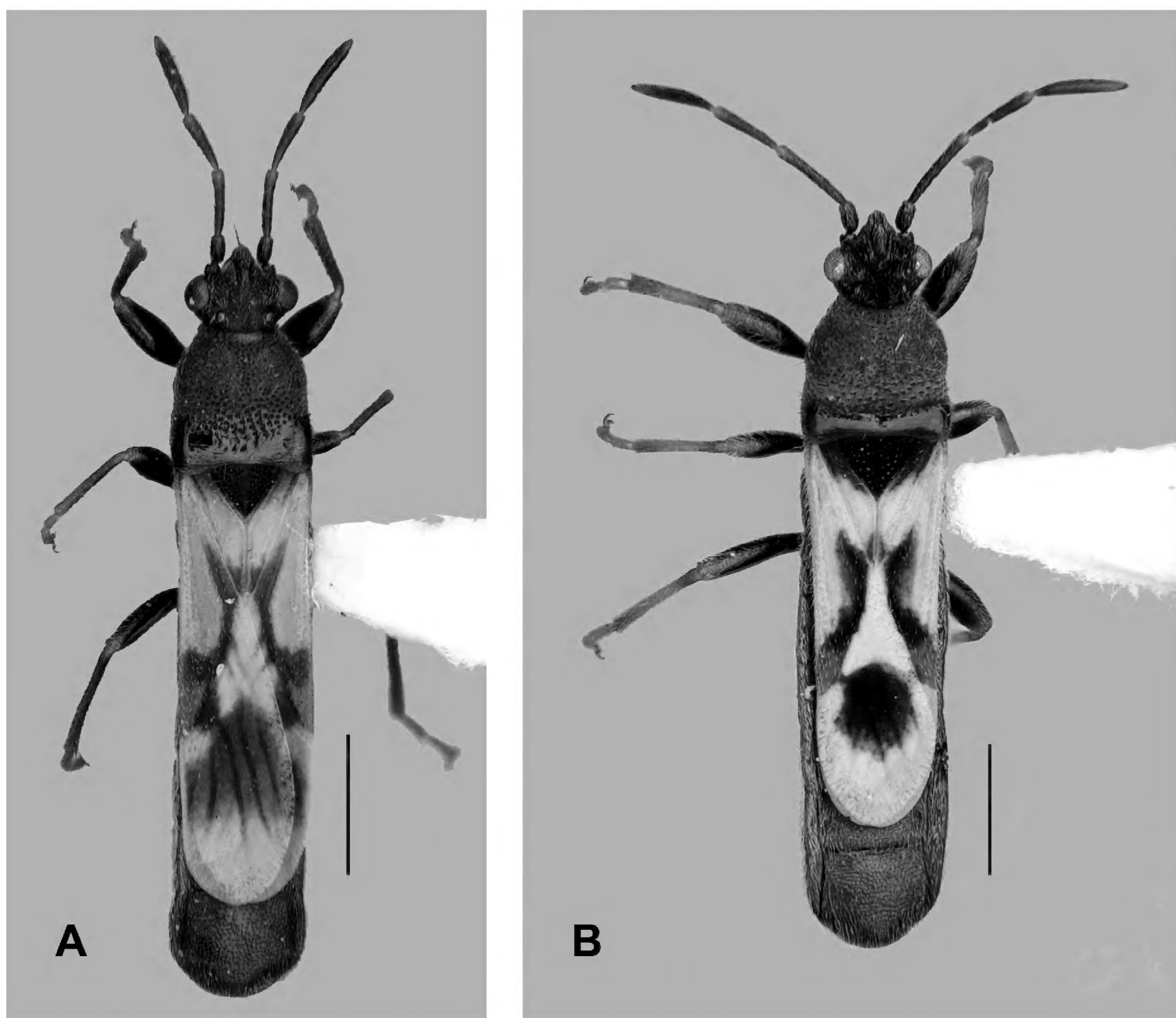


Figure 2. Dorsal habitus. **A.** *Ischnodemus nigromaculatoides* sp. nov.; **B.** *Ischnodemus formosus* sp. nov. Scale bars: 1 mm.

subtriangular, posterior margin with a small concavity medially. Parameres: blade long, outer projection thumb like (Fig. 6B).

Etymology. The epithet is the Latin adjective *formosus*, -a, -um, meaning ‘beautiful’, also referring to Formosa, the Argentinean province where the type material was collected.

Distribution. Only known from Formosa Province, Argentina.

Measurements of paratypes (min–max, mean).

Males ($n = 4$): Total length 5.50–5.81, 5.65. Head length 0.73–0.81, 0.75, head width 0.88–0.96, 0.91, interocular space 0.55–0.60, 0.57, interocellar space 0.31–0.36, 0.33. Labial segments length: I 0.32–0.34, 0.32, II 0.38–0.40, 0.39, III 0.30–0.40, 0.35, IV 0.38–0.40, 0.39. Antennal segments length: scapus 0.20–0.22, 0.22 pedicellus 0.60–0.70, 0.64, basiflagellomere 0.50–0.62, 0.55, distiflagellomere 0.74–0.78, 0.75. Pronotum length 1.04–1.12, 1.08, pronotum width 1.17–1.25, 1.21. Hemelytra length 2.96–3.28, 3.07.

Females ($n = 5$): Total length 6.56–7.72, 7.10. Head length 0.83–0.88, 0.85, head width 0.96–1.07, 1.01, interocular space 0.60–0.68, 0.63, interocellar space

0.36–0.42, 0.40. Labial segments length: I 0.34–0.42, 0.38, II 0.42–0.50, 0.45, III 0.40–0.46, 0.42, IV 0.42–0.52, 0.47. Antennal segments length: scapus 0.22–0.26, 0.24 pedicellus 0.60–0.70, 0.65, basiflagellomere 0.54–0.64, 0.59, distiflagellomere 0.76–0.88, 0.78. Pronotum length 1.07–1.33, 1.21, pronotum width 1.33–1.53, 1.42. Hemelytra length 3.36–3.92, 3.68.

***Ischnodemus infernalis* sp. nov.**

<https://zoobank.org/4433E5BC-9337-4014-94C6-92BB0F8BD2C5>

Figs 3A, 4C, 5C, 6C

Lsid link. <http://lsid.speciesfile.org/urn:lsid:Lygaeoidea.speciesfile.org:TaxonName:518391>.

Type material. *Holotype* ARGENTINA • male; Chaco, 2.3 km S Pampa del Infierno; 26.529°S, 61.185°W; 18-XII-2018; Dellapé, P.M. col.; MLP he-10571.

Paratypes: ARGENTINA — **Chaco Prov.** • 11 males 7 females; same data as for holotype; MLP he-10572 to he-10582 (males) he-10583 to he-10589 (females) • 2 males 2 females; same data as for preceding; USNM • 2 males 2

females; same data as for preceding; MACN • 1 male; SE side of Corzuela, off Natl. Rd. 80, 200 m; 26°57.090'S, 60°59.022'W; 19 Dec. 2018; Henry, T.J. col.; USNM • 1 male 5 females; 3 km S of Pampa del Infierno, Prov. Rd. 5, 150 m; 26°31.779'S, 61°11.092'W; 18-XII-2018; Henry, T.J. col.; on *Cortaderia* sp.; USNM.

Description (male holotype). (Fig. 3A) Total length 5.69. Head, pronotum and scutellum punctate except posterior one fifth of pronotum smooth; sparsely clothed with short decumbent, semidecumbent and erect setae.

Head black, clypeus paler, shagreened and shiny dorsally. Head length 0.73, head width 0.88, interocular space 0.52. Vertex flat, eyes ovoid, and set well away from anterolateral pronotal angles. Ocelli relatively large, interocellar space 0.34, closer to anterior margin of pronotum than to the eyes. Labium short attaining anterior margin of mesosternum. Labial segments length: I 0.40, II 0.34, III 0.32, IV 0.26. Antennae brown, apex of pedicellus and basiflagellomere and distiflagellomere paler; with abundant semierect setae; scapus slightly surpassing apex of clypeus, antennal segments length: scapus 0.20, pedicellus 0.42, basiflagellomere 0.46, distiflagellomere 0.66.

Pronotum (Fig. 4C) slightly sinuate laterad, narrowing gradually from mid-length of anterior lobe to collar; transverse impression shallow, nearly obsolete; posterior margin concave. Pronotum length 1.14, pronotum width 1.01. Pronotum shagreened and black except posterior one fifth smooth and brown, shiny with pruinose areas restricted to irregular patches. Humeral lobes lateral to scutellum pruinose. Metathoracic scent gland auricle slightly produced anteriorly, yellowish basally and brown dorsally. Scutellum grey-black, pruinose, with a longitudinal median fringe without punctures. All femora moderately incrassate, mutic. Coxae and femora dark brown, femora paler apically; trochanters, tibiae and tarsi light brown. All legs with abundant semierect and decumbent short setae. Hemelytra reaching mid-length of 6th abdominal tergum, length 3.16. Hemelytra yellowish, except apical area of corium orange brown, and with dark brown as follows: basal one fourth of clavus, apical half of Cu vein and posterior margin of corium extending to outer margin of corium adjacent to the orange brown apical area, and a large irregular and diffuse median macula on membrane not contacting posterior margin of corium next to orange macula. Sterna pruinose, except a rectangular shiny area on mesosternum.

Abdomen brown irregularly pigmented. Male genitalia: Pygophore (Fig. 5C) dorsal aperture elongate, anterior margin slightly rounded, inner projections short, posterior margin deeply concave medially. Parameres: blade long, outer projection thumblike, small (Fig. 6C).

Intraspecific variation. The antenna varies from uniformly dark brown to brown with the distiflagellomere darker. The anterior pronotal lobe shows a median shallow longitudinal sulcus. Femora of some specimens less pigmented, and tibiae somewhat darker, not strongly contrasting with femora. Some specimens show the median macula of the membrane darker and well defined;

the brown pattern of corium is restricted to the distal area adjacent to the orange area or can extend anteriorly to the apex of clavus.

Etymology. The specific epithet is the Latin adjective *infernalis*, -is, -e, meaning ‘infernally’, referring to the locality ‘Pampa del Infierno’ where the holotype and most of the paratypes were collected.

Distribution. Only known from Chaco Province, Argentina.

Measurements of paratypes (min–max, mean).

Males ($n = 4$): Total length 5.56–5.94, 5.71. Head length 0.68–0.75, 0.71, head width 0.83–0.94, 0.88, interocular space 0.55–0.62, 0.56, interocellar space 0.31–0.36, 0.34. Labial segments length: I 0.32–0.40, 0.38, II 0.32–0.40, 0.36, III 0.32–0.38, 0.34, IV 0.28–0.40, 0.32. Antennal segments length: scapus 0.18–0.20, 0.20 pedicellus 0.50–0.56, 0.50, basiflagellomere 0.42–0.46, 0.45, distiflagellomere 0.62–0.64, 0.64. Pronotum length 1.07–1.17, 1.13, pronotum width 1.01–1.09, 1.04. Hemelytra length 2.92–3.20, 3.07.

Females ($n = 5$): Total length 7.12–7.68, 7.41. Head length 0.81–0.83, 0.83, head width 0.96–1.01, 0.99, interocular space 0.62–0.65, 0.64, interocellar space 0.36–0.42, 0.39. Labial segments length: I 0.36–0.40, 0.40, II 0.40–0.48, 0.44, III 0.34–0.40, 0.44, IV 0.36–0.40, 0.38. Antennal segments length: scapus 0.20–0.26, 0.24 pedicellus 0.56–0.60, 0.59, basiflagellomere 0.50–0.56, 0.54, distiflagellomere 0.64–0.76, 0.71. Pronotum length 1.12–1.20, 1.19, pronotum width 1.30–1.40, 1.34. Hemelytra length 3.00–3.76, 3.49.

Ischnodemus correntinus sp. nov.

<https://zoobank.org/79FE6926-7863-404B-9A85-760698754F55>

Figs 3B, 5D, 6D

Ischnodemus stalii (misidentification): Melo et al. (2004: 66).

Lsid link. <http://lsid.speciesfile.org/urn:lsid:Lygaeoidea.speciesfile.org:TaxonName:518390>.

Type material. *Holotype* ARGENTINA • male; Corrientes, Col. Pellegrini; 27-IX-2002; Malaise trap; MLP he-10553 (Fig. 3B).

Description. (Fig. 3B) Total length 6.13. Head, pronotum and scutellum punctate, shallowly punctate on posterior half of posterior pronotal lobe; clothed with short decumbent, semidecumbent and erect setae.

Head grey-black, pruinose dorsally except shiny clypeus and antenniferous tubercles. Head length 0.65, head width 1.01, interocular space 0.62. Vertex slightly convex, eyes ovoid, and set well away from anterolateral pronotal angles. Ocelli much closer to anterior margin of pronotum than to the eyes, interocellar space 0.34. Labium short, not attaining anterior margin of mesosternum. Labial segments length: I 0.34, II 0.34, III 0.30, IV 0.26. Antennae brown, distiflagellomere paler medially; with abundant decumbent and sparse erect setae; scapus surpassing apex of clypeus by half its length, antennal

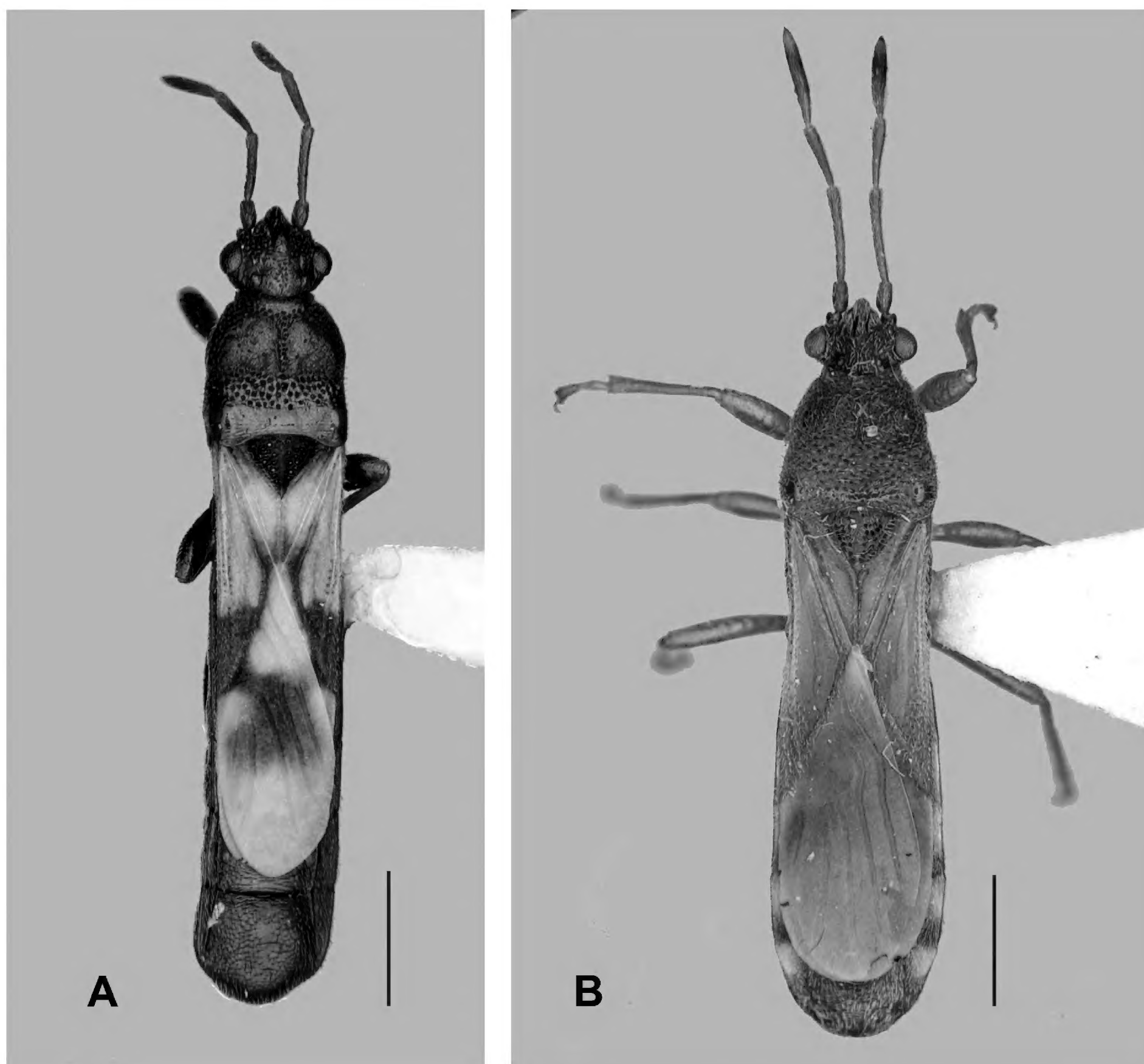


Figure 3. Dorsal habitus. **A.** *Ischnodemus infernalis* sp. nov.; **B.** *Ischnodemus correntinus* sp. nov. Scale bars: 1 mm.

segments length: scapus 0.26, pedicellus 0.78, basiflagellomere 0.58, distiflagellomere 0.80.

Pronotum slightly sinuate laterad, narrowing gradually from mid-length of anterior lobe to collar; transverse impression shallow, nearly obsolete; posterior margin concave. Pronotum length 1.04, pronotum width 1.43. Anterior pronotal lobe grey-black, pruinose with intermixed small shiny spots, collar entirely pruinose; posterior pronotal lobe brown with three distinct shiny areas (pair of oval spots on humeri and a transversely elongate median band). Metathoracic scent gland auricle slightly produced anteriorly, orange brown dorsally. Scutellum grey-black, pruinose, with a longitudinal median fringe without punctures. All femora moderately incrassate, mutic. Coxae brown, rest of legs light brown. All legs with abundant decumbent short setae. Hemelytra attaining half the length of 7th abdominal tergum, length 3.84. Hemelytra yellowish brown, with base of clavus and apical region of corium darker; membrane smoky brown, veins concolorous.

Sterna pruinose, except a two quadrangular shiny areas on mesosternum, densely clothed with short decumbent setae.

Abdomen dark brown, connexiva contrastingly paler, with the anterior outer region yellowish. Male genitalia: Pygophore (Fig. 5D) dorsal aperture broad, anterior margin slightly rounded, inner projections triangular, posterior margin shallowly concave medially. Parameres: blade long, curved, inner projection truncated basally, outer projection elongate (Fig. 6D).

Etymology. The specific epithet is a Latinized word created from the Spanish adjective *correntino*, -a, meaning “related to the Corrientes”, in reference to Corrientes Province (Argentina) where the holotype was collected. To be treated as an adjective (*correntinus*, -a, -um).

Distribution. Only known from the type locality Col. Pellegrini, Corrientes Province, Argentina.

Remarks. This specimen was mentioned in the inventory from Colonia Carlos Pellegrini (Esteros de Iberá, Corrientes, Argentina) as *Ischnodemus stalii* (Melo et. al. 2004).

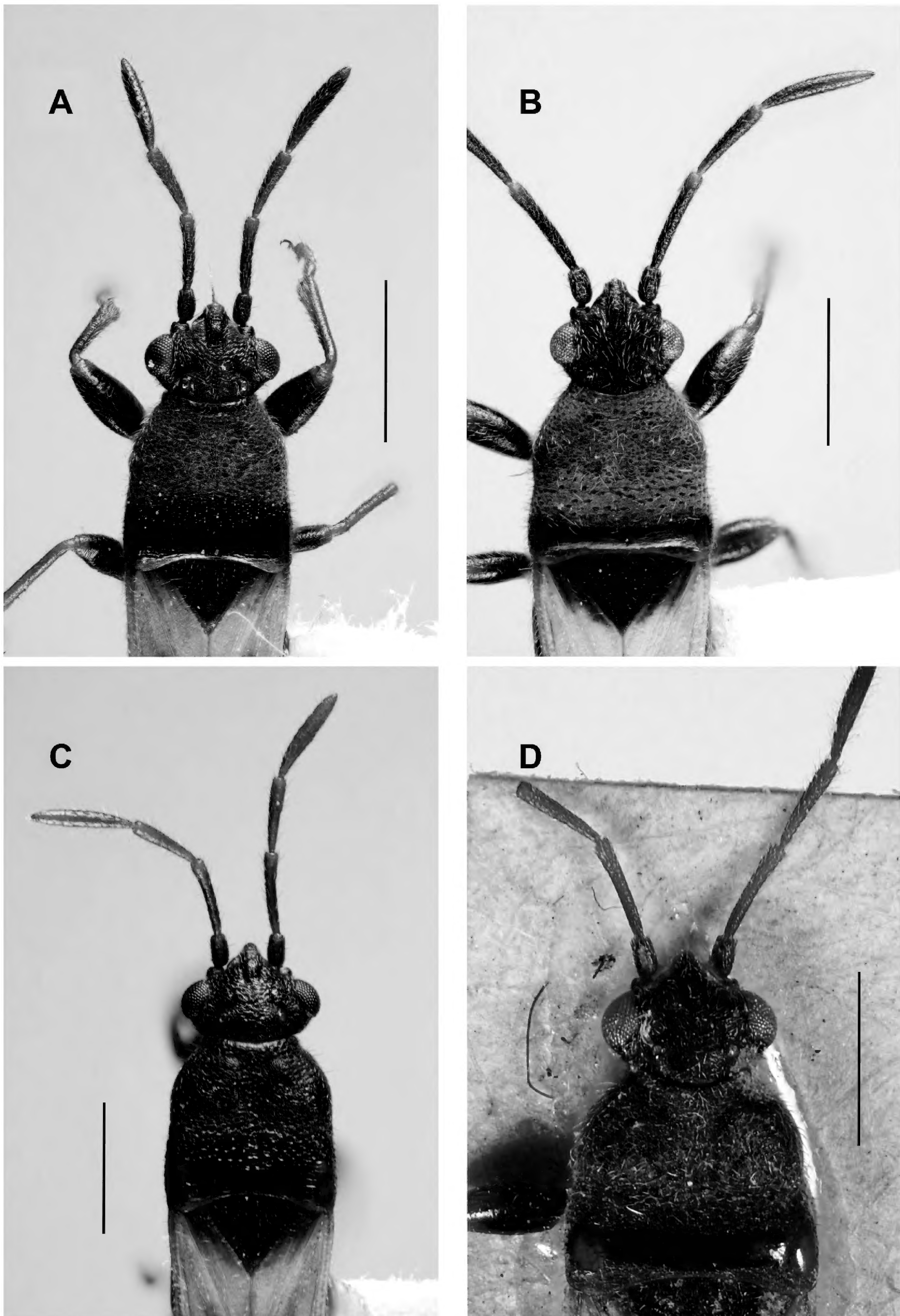


Figure 4. Head and pronotum. **A.** *Ischnodemus nigromaculatoides* sp. nov.; **B.** *Ischnodemus formosus* sp. nov.; **C.** *Ischnodemus infernalis* sp. nov.; **D.** *Ischnodemus nigromaculatus* Slater & Wilcox, 1969 (HNHM). Scale bars: 1 mm.

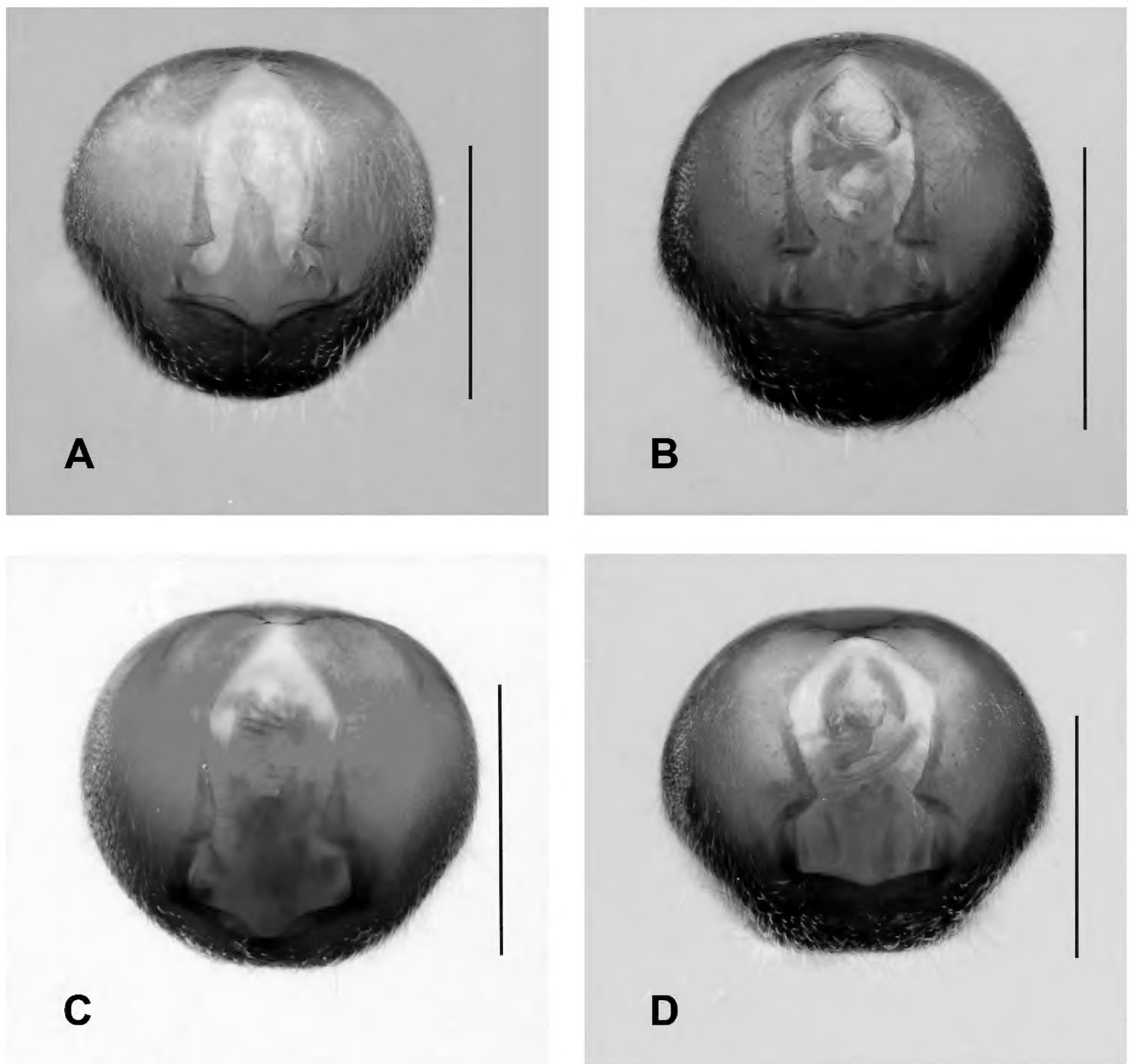


Figure 5. Pygophore, posterodorsal view. **A.** *Ischnodemus nigromaculatooides* sp. nov.; **B.** *Ischnodemus formosus* sp. nov.; **C.** *Ischnodemus infernalis* sp. nov.; **D.** *Ischnodemus correntinus* sp. nov. Scale bar: 0.5 mm.

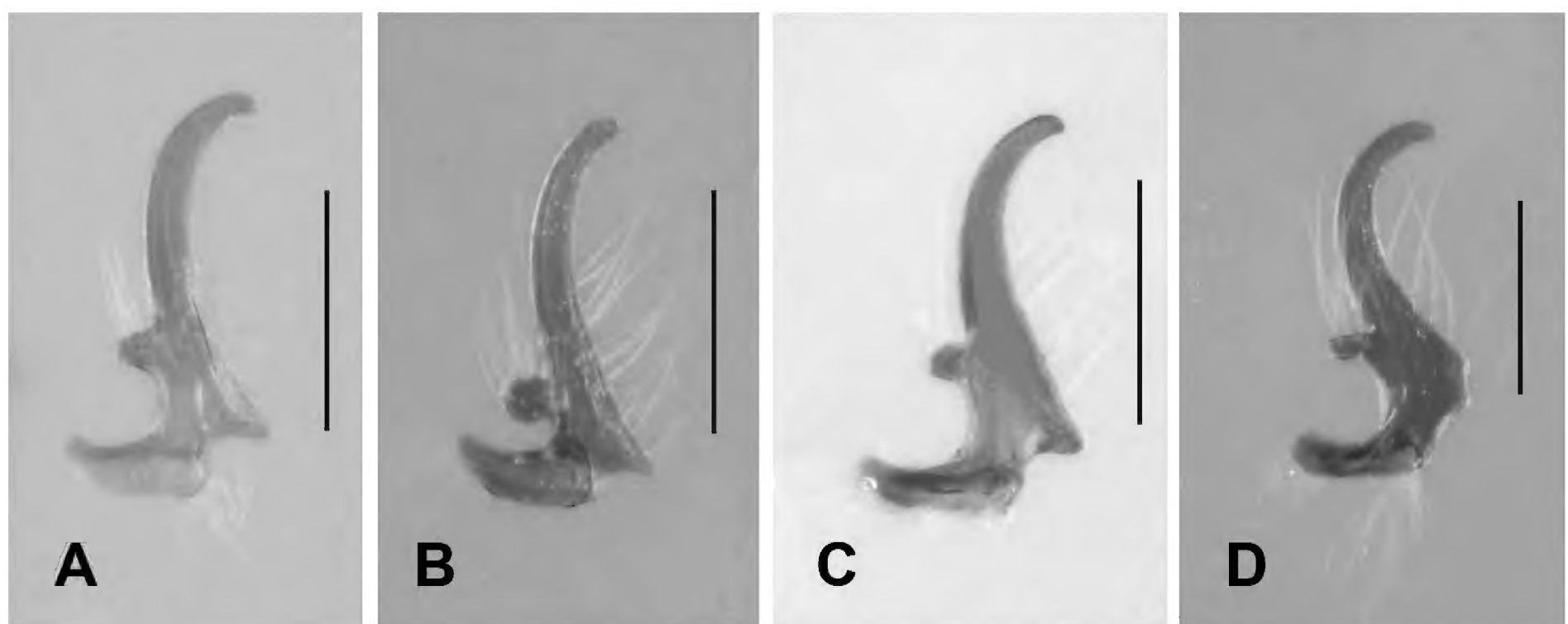


Figure 6. Right paramere. **A.** *Ischnodemus nigromaculatooides* sp. nov.; **B.** *Ischnodemus formosus* sp. nov.; **C.** *Ischnodemus infernalis* sp. nov.; **D.** *Ischnodemus correntinus* sp. nov. Scale bar: 0.25 mm.

New records from Argentina

Ischnodemus bosqi Slater & Wilcox, 1969

Lsid link. <http://lsid.speciesfile.org/urn:lsid:Lygaeoidea.speciesfile.org:TaxonName:489280>.

Material examined. ARGENTINA — **Buenos Aires Prov.** • 1 male; Magdalena, Reserva Natural Privada El Destino; 35.135°S, 57.391°W; 14-II-2018; Montemayor, S. col.; MLP. — **Entre Ríos Prov.** • 1 male; Isla Lechiguana, Ibicuy; 7-XI-2006; Melo, M.C. col.; MLP • 1 female; Entre Ríos, Colón; III-2003; Carpintero- Cicchino cols. MLP. — **Formosa Prov.** • 1 female; 2 km E Mojón de Fierro; 26.044°S, 58.020°W; 10-XII-2018; Dellapé & Melo cols.; MLP • 1 female; Ea. La Marcela, 35 km E El Colorado; 4-X-2007; Dellapé, P. col.; MLP • 1 male; same data as for preceding; 3-X-2007; MLP. — **Tucumán Prov.** • 1 female; El Infiernillo; IV-1986; Carpintero, D.L. col.; MLP.

Distribution. Argentina. Brazil.

Known Argentinean distribution. Buenos Aires, Chaco, Corrientes, Jujuy, and Misiones provinces (Slater and Wilcox 1969; Melo et al. 2004; Dellapé and Carpintero 2012; Dellapé 2014; Dellapé et al. 2015), Entre Ríos, Formosa, and Tucumán Provinces (new records). <https://biodar.unlp.edu.ar/pentatomomorpha/en/info/20079.html>.

Ischnodemus grossinigrus Slater & Wilcox, 1969

Lsid link. <http://lsid.speciesfile.org/urn:lsid:Lygaeoidea.speciesfile.org:TaxonName:489268>.

Material examined. ARGENTINA — **Santa Fe Prov.** • 1 female; Piquete; 16-I-[19]28; M.N.; MLP • 1 male; 1-XII-[19]27; Bridarolli col.; MLP • 1 male; 1-?-[19]27; Reboredo col.; MLP.

Distribution. Argentina.

Known Argentinean distribution. Buenos Aires, Entre Ríos, and Formosa provinces (Slater and Wilcox 1969; Dellapé 2014), Santa Fe province (new record). <https://biodar.unlp.edu.ar/pentatomomorpha/en/info/20082.html>.

Ischnodemus paramoides Slater & Wilcox, 1969

Lsid link. <http://lsid.speciesfile.org/urn:lsid:Lygaeoidea.speciesfile.org:TaxonName:489251>.

Material examined. ARGENTINA — **Formosa Prov.** • 1 female; P.N. Rio Pilcomayo, mirador del Rio; 25.015°S, 58.130°W; 24-II-2022; Dellapé, P.M. col.; MLP.

Distribution. Argentina and Paraguay.

Known Argentinean distribution. Chaco, Santa Fe and Misiones (see remarks) provinces (Slater and Wilcox 1969; Dellapé 2014); Formosa Province (new record). <https://biodar.unlp.edu.ar/pentatomomorpha/en/info/20086.html>.

Remarks. Slater and Wilcox (1969) mentioned one paratype from Posadas, Mendoza Province, but it must be Misiones Province. Dellapé (2014) also followed the error.

Patritiodemus brusai (Dellapé & Montemayor, 2009), comb. nov.

Lsid link. <http://lsid.speciesfile.org/urn:lsid:Lygaeoidea.speciesfile.org:TaxonName:491523>.

Remarks. Dellapé and Montemayor (2009) related *Ischnodemus brusai* with *I. proprius* Slater, 1966 and *I. transitius* Slater & Wilcox, 1969. These two species show a completely pruinose pronotum and large eyes and were interpreted by Slater and Wilcox (1969) as closely related species with obscure relationships with the rest of the species in the genus, being transitional with *Patritiodemus* species. The generic limits among these two genera are not clearly established. Slater and Ahmad (1969) described the genus *Patritiodemus* as closely allied to *Ischnodemus*, and some years later, Slater (1979), in analyzing the generic phylogenetic relationships, expressed that both *Cavelerius* Distant, 1903 and *Patritiodemus* could conceivably be included in *Ischnodemus* and that the establishment of *Patritiodemus* was possibly premature.

Additional phylogenetic studies will be necessary to better define the generic limits. The presence of pedunculate eyes, a short labium not attaining forecoxae, an entirely dull pronotum, and the color pattern of hemelytra with a dark suffusion along the central area in *Patritiodemus brusai* comb. nov. indicate that the genus *Patritiodemus* is the best placement for this species.

Discussion

Slater (1979) attempted to establish phylogenetic relationships within the genus *Ischnodemus* based on a phylogenetic scheme of species groups, mostly in agreement with the Neotropical species groups established by Slater and Wilcox (1969). No modern phylogenetic analysis has been done since these works.

More than a half of the Neotropical species of *Ischnodemus* are recorded from central and northeastern Argentina, mostly distributed in the Chaco and Pampa ecoregions where grasslands are abundant. A recent study on mitogenomes of 10 species in eight genera of Blissidae (Wang et al. 2022) suggested that consistency of divergence time between Blissidae and Poaceae might hint at the co-evolutionary relationship between these families.

The new species described in this work, *I. nigromaculatoides* sp. nov., *I. formosus* sp. nov., and *I. infernalis* sp. nov., are quite similar to *I. nigromaculatus* in general color pattern, with only subtle differences. However, these species can be easily discriminated by the texture of head and pronotum and hemelytral color pattern. In *I. nigromaculatus* and *I. formosus* sp. nov. the head, collar and the posterior margin of pronotum are pruinose, whereas in *I. nigromaculatoides* sp. nov. the head is pruinose, but the collar is shiny mesally, and the pruinosity on the posterior margin of pronotum

tum is restricted to the humeral areas, being only shiny mesally. In *I. infernalis* sp. nov. the head and the anterior pronotal lobe are shiny, with the pruinosity restricted to small irregular patches. The pruinosity pattern was considered a fundamental character by Slater and Wilcox (1969), who found it surprisingly constant within species with only rare exceptional specimens. *Ischnodemus formosus* sp. nov. can be separated from *I. nigromaculatus* by the discontinuous basal and apical dark areas of clavus and, the central dark hemelytral macula relatively small and not contacting the lateral margins of membrane. In *I. nigromaculatus* the basal and apical dark areas of clavus are connected by a dark stripe along the inner claval margin, and the central dark hemelytral macula is relatively large, contacting the lateral margins of membrane.

The additional material (varieties ‘a’ and ‘b’) mentioned by Slater and Wilcox (1969) for *I. nigromaculatus* and *I. lactipennis* (the authors stated that these last specimens were among the most puzzling of the Neotropical material) are an example of how complex and difficult it can be to establish specific limits in this diverse group of chinch bugs, particularly when long series of specimens are not available and when species with similar color patterns are involved. The new species described in this contribution reflect a hidden diversity in these similar-appearing bugs and suggest that the record of *I. nigromaculatus* from Trinidad by Baranowski and Slater (2005) should be carefully re-assessed.

The fourth new species described in the present paper, *Ischnodemus correntinus* sp. nov., can be easily separated from the other seven Neotropical species with three shiny spots on posterior lobe of pronotum by the yellowish femora and tibiae, the concolorous veins on the hemelytra, and the pale color of the connexiva contrasting with the rest of the abdomen.

Acknowledgments

We are grateful to Anna Ágnes Somogyi (HNHM) for kindly providing the photographs of the holotype of *I. nigromaculatus*. We also thank Thomas J. Henry (Systematic Entomology Laboratory, ARS, USDA c/o National Museum of Natural History (NMNH), Washington, DC), who kindly reviewed the manuscript and offered comments for its improvement.

Field trips were partially funded by Fondo para la Investigación Científica y Tecnológica (FONCYT) PICT 2018-0771, and the Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) PIP 1505.

References

- Alayo P, Grillo H (1982) El género *Ischnodemus* Fieber (Heteroptera: Lygaeidae; Blissinae) en Cuba. *Centro Agrícola* 29: 51–63.
- Baranowski RM, Slater JA (2005) The Lygaeidae of the West Indies. Agricultural Experiment Station, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, 266 pp.
- Dellapé PM (2014) Lygaeoidea. In: Roig-Juñent S, Claps LE, Morrone JJ (Eds) Biodiversidad De Artrópodos Argentinos (Volumen 3). Editorial INSUE–UTN, Tucumán, 421–438. <https://www.seargentina.com.ar/libros-digitales-de-libre-acceso/>
- Dellapé PM, Carpintero DL (2012) Relevamiento de los Heteroptera (Insecta: Hemiptera) de las sierras de Tandil, provincia de Buenos Aires, Argentina. *Revista del Museo Argentino de Ciencias Naturales* 14(1): 125–134. <https://doi.org/10.22179/REVMACN.14.212>
- Dellapé PM, Henry TJ (2022) Lygaeoidea Species File. Version 5.0/5.0. [Available from:] <http://Lygaeoidea.SpeciesFile.org> [Accessed June 2022]
- Dellapé PM, Montemayor SI (2009) Description of a new species of *Ischnodemus* from Peru, and the male and immature stages of *I. subflavus* (Hemiptera: Heteroptera: Lygaeoidea: Blissidae). *Revista Mexicana de Biodiversidad* 80(3): 687–691. <https://doi.org/10.22201/ib.20078706e.2009.003.165>
- Dellapé PM, Melo MC, Montemayor SI, Dellapé G, Brailovsky H (2015) Terrestrial Heteroptera (Hemiptera) from Moconá Provincial Park (Misiones, Argentina). *Check List* 11(3): 1–18. <https://doi.org/10.15560/11.3.1662>
- Dellapé PM, Melo MC, Dellapé G, Olivera L (2022) Pentatomomorpha (Hemiptera: Heteroptera) species from Argentina and Uruguay. <https://biodar.unlp.edu.ar/pentatomomorpha/> [Accessed Sept. 9, 2022]
- Distant WL (1903) Contributions to a knowledge of the Rhynchota. *Annales de la Société Entomologique de Belgique* 47: 43–65.
- Henry TJ, Dellapé PM, de Paula A (2015) The big-eyed bugs, chinch bugs, and seed bugs (Lygaeoidea). In: Panizzi A, Grazia J (Eds) True Bugs (Heteroptera) of the Neotropics. Springer Publishing Co., England and USA, 459–514. https://doi.org/10.1007/978-94-017-9861-7_16
- Melo MC, Dellapé PM, Carpintero DL, Coscarón MC (2004) Reduviidae, Miridae y Lygaeoidea (Heteroptera) colectados en Colonia Carlos Pellegrini (Esteros de Iberá, Corrientes, Argentina). *Revista de la Sociedad Entomológica Argentina* 63(1–2): 56–67.
- Schuh RT, Weirauch C (2020) True bugs of the world (Hemiptera: Heteroptera): classification and natural history (2nd Edn.). Siri Scientific press, Manchester, 468 pp. [+ 32 plates]
- Slater JA (1966) New micropterous Blissinae from South America (Hem. Lyg.). *University of Connecticut Occasional Papers Biological Science Series* 1(1): 3–11.
- Slater JA (1979) The systematics, phylogeny, and zoogeography of the Blissinae of the world (Hemiptera, Lygaeidae). *Bulletin of the American Museum of Natural History* 165: 1–180. <https://digitallibrary.amnh.org/handle/2246/1076>
- Slater JA, Ahmad I (1969) Neotropical Blissinae: *Patritiodemus*, a new genus with six new species (Hemiptera, Lygaeidae). *Acta Entomologica Musei Nationalis Pragae* 38: 127–139.
- Slater JA, Harrington JE (1970) A revision of the genus *Ischnodemus* Fieber in the Ethiopian Region (Hemiptera: Lygaeidae, Blissinae). *Annals of the Transvaal Museum* 26(11): 211–275.
- Slater JA, Wilcox DB (1969) A revision of the genus *Ischnodemus* in the Neotropical Region (Hemiptera: Lygaeidae; Blissinae). *Miscellaneous Publications of the Entomological Society of America* 6: 199–238.

- Slater JA, Wilcox DB (1970) New species of Blissinae from Madagascar (Hemiptera: Lygaeidae). The proceedings of the Royal Entomological Society of London (B) 39(3–4): 33–40. <https://doi.org/10.1111/j.1365-3113.1970.tb00255.x>
- Slater JA, Wilcox DB (1973) The Blissinae or Chinch Bugs of South Africa. (Hemiptera: Lygaeidae). Memoirs of the Entomological Society of Southern Africa 12: 1–135.
- Slater JA, Ashlock PD, Wilcox DB (1969) The Blissinae of Thailand and Indochina (Hemiptera: Lygaeidae). Pacific Insects 11(3–4): 671–733.
- Wang S, Zhu R, Xue H, Li Y, Bu W (2022) Mitogenomics of chinch bugs from China and implications for its coevolutionary relationship with grasses. Insects 13(643): 1–8. <https://doi.org/10.3390/insects13070643>

Supplementary material 1

Data occurrences of studied material

Authors: Pablo M. Dellapé, María C. Melo

Data type: occurrences

Copyright notice: This dataset is made available under the Open Database License (<http://opendatacommons.org/licenses/odbl/1.0>). The Open Database License (ODbL) is a license agreement intended to allow users to freely share, modify, and use this Dataset while maintaining this same freedom for others, provided that the original source and author(s) are credited.

Link: <https://doi.org/10.3897/dez.69.94683.suppl1>